Operation and Maintenance Plan

Otter Tail Ag Enterprises, LLC
Fergus Falls, Minnesota

Prepared for:
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Attachments

4.0 PREVENTATIVE MAINTENANCE

The Facility will implement a Mapcon Technologies, Inc. preventative maintenance system to track the inventory of spare parts for the control units. As parts are taken out of inventory, the Mapcon system will notify Facility staff if the inventory falls below a preset level. The system is also used to track equipment histories which show breakdown frequencies and repair costs. This information can be used to determine if equipment upgrade, modification, or replacement is warranted.

This preventive maintenance varies from weekly pump checks and greasing schedules to annual oil changes in all the gearboxes in the Facility. These items can be viewed in the maintenance data base.

Scheduled maintenance is performed during shutdowns or when plant conditions allow the equipment to be shut down. Many of these items are the result of normal wear and tear. Most of these items can be identified and corrected during a scheduled shutdown so as to not affect normal plant operation. Observation and inspection by maintenance and operations personnel will usually indicate that a piece of equipment needs maintenance long before a breakdown occurs and the maintenance can be performed at the nearest opportunity before impacting plant operations.

Many maintenance items are planned based on Facility operating parameters. These would include clean in place (CIP) of heat exchangers, cleaning of strainers, and CIP of tanks. Other maintenance items are scheduled for set times during the course of the year. These would include inspections of the dryer, RTO units, storage tanks, distillation units.

The Facility Process Safety Management Program includes a Mechanical Integrity (MI) element; which specifically addresses the "covered process" equipment's mechanical integrity and the preventative maintenance program requirements. Typically, by OSHA's definition, the "covered process (es)" include the process equipment from the beer column through to the final ethanol storage tanks. As part of the MI program, the Facility also incorporates the equipment manufacture's specifications and their recommended terms for the "preventative maintenance".

Where there is no defined manufacturer's specifications/recommendations for a specific piece of equipment, the Facility will follow industry standards and/or practices. By incorporating these proactive preventative measures at the facility, the Facility believes it will eliminate the possibility of equipment breakdown and the need to have critical replacement parts/pieces in inventory. If needed, the Facility can obtain the critical equipment parts within a very short period of time.

The typical equipment at the Facility that requires routine inspection and maintenance include the RTO, Baghouses, and the Scrubbers. Manufacturer information for the specific equipment used on-site is included in Attachments A, B, and C, respectively.

Inspections of such units will meet the requirements of the manufacturer. All necessary maintenance performed at the Facility, will be performed as needed and documented accordingly.

1.0 INTRODUCTION

This Operation and Maintenance Plan, herein referred to as the "Plan", meets the requirements listed in permit number 11100077-002 for the Otter Tail Ag Enterprises, LLC (Facility) fuel ethanol production facility located in Fergus Falls, Minnesota.

The Plan has been developed to reflect the Facility's operations with regards to the air pollution control equipment operation and maintenance. At a minimum, the following air pollution control equipment is required to be included within the Plan.

Unit ID	Control Unit Description	Associated Units
CE001	Grain Receiving Baghouse 1	Corn dump pit/auger 1, corn conveyor 1, corn elevator 1, Corn dump pit/auger 2, corn conveyor 2, corn elevator 2, Transfer conveyor 1
CE008	Hammermill Baghouse	Scalper, Reclaim system, Grinder Surge Bin, Hammermill 1, Hammermill 2, Hammermill 3
CE011	DDGS Loadout Baghouse	DDGS Storage Reclaim, Bulkweigher, DDGS conveyor and DDGS load spout
CE026	Flare	Truck ethanol loadout
CE027	CO2 Scrubber	Yeast tank, Fermenter 1-4, and Beer Well
CE028	Vent Gas Scrubber	Liquefaction Tank, distillation, dehydration, centrifuges, and centrate tank
CE029	Multiple Cyclonse	DDGS Dryer
CE030	Regenerative Thermal Oxidizer (RTO)	DDGS Dryer and cooler

The Plan has been completed to fulfill air permit requirements in accordance with Minn. R. 7007.0800, subp. 14, and Minn. R. 7007.0800 subp. 16(J).

The Plan also discusses the conditions related to the plant haul roads. The Plan will be updated as deemed necessary based on future plant operations or every five (5) years.

2.0 GENERAL PLAN INFORMATION

The Facility's pollution control equipment consists of fabric filters (baghouses), wet scrubbers, thermal oxidizers, multi-clones, a flare, and paved roads. The Plan also provides additional information regarding the operating limits of each emission source.

The following information pertains to the equipment covered under the Plan, including limits or operating capacities as required by the air permit.

2.1 Description of Equipment / Limitations – Ethanol Production Plant Permit

Each of the following baghouse units (CE001 through CE011) must operate with a particulate matter (PM) and particulate matter less than 10 microns (PM_{10}) outlet collection efficiency greater than or equal to 99%. The pressure drop for each unit must be greater than or equal to 1 inch and less than or equal to 6 inches of water column, or as set during the most recent compliance test.

Fabric Baghouse (CE001): The baghouse is used for controlling PM emissions from the Corn Dump Pit/Auger 1 (EU001), Corn Conveyor 1 (EU002), and Corn Elevator 1 (EU003), Corn Dump Pit/Auger 2 (EU004), Corn Conveyor 2 (EU005), and Corn Elevator 2 (EU006), Transfer Conveyor 1 (EU007).

Fabric Baghouse (CE008): The baghouse is used for controlling PM emissions from the Scalper (EU008), Reclaim System (EU009), Grinder Surge Bin (EU010), Hammermill #1 (EU011), Hammermill #2 (EU012), and Hammermill #3 (EU055).

Fabric Baghouse (CE011): The baghouse is used for controlling PM emissions from the DDGS Storage Reclaim (EU013), Bulkweigher (EU014), DDGS Conveyor (EU015) and DDGS Load Spout (EU016).

CO_2 Wet Scrubber (CE027): The scrubber controls volatile organic carbon (VOC) emissions from the gas exhaust from the yeast tank, beer well and fermentation process (EU033–EU038). The pressure differential and water flow rate must be observed and recorded daily. The pressure drop will be maintained greater than or equal to 2 inches of water column and less than or equal to 6 inches of water column and water flow rate greater than 55 gallons/minute or as determined by the most recent performance testing that demonstrated compliance with the permitted emission limit.

Vent Gas Absorption Scrubber: The scrubber controls VOC emissions from the gas exhaust from the distillation processes units (EU039-EU049). The pressure differential and water flow rate must be observed and recorded daily. The pressure drop will be maintained greater than or equal to 2 inches of water column and less than or equal to 6 inches of water column and water flow rate greater than 6 gallons/minute or as determined by the most recent performance testing that demonstrated compliance with the permitted emission limit.

Regenerative Thermal Oxidizer (CE030): The regenerative thermal oxidizer (RTO) is fired with natural gas. The RTO controls emissions from the DDGS Dryer (EU050) and DDGS Cooler (EU051). The combustion operating temperature must be greater than or

equal to 1400 degrees F, using a 3-hour average at the combustion chamber, or as set during the most recent compliance test.

PM/PM_{10}, nitrogen oxide (NOx), volatile organic compounds (VOC), and carbon monoxide (CO) limitations apply to the TO/HRSG. The opacity limit from the single exhaust stack must be less than 20%.

Multiple Cyclone (CE029): The purpose of the multi-clone is remove PM as a pre-treatment of the dryer exhaust stream, prior to discharging to the RTO.

Flare (CE026): The flare is used to control VOC emissions from the ethanol truck loadout process. The flare must be designed and operate with no visual emissions, except for a period not to exceed 5 minutes during any 2 consecutive hours.

Haul Roads (FS004) – All plant roads must be paved. The plant roads shall be constructed and maintained in order to minimize the generation of dust (PM/PM_{10}) emissions. The haul roads will be inspected annually to ensure structural integrity. If required, the Facility will patch or repave sections of the roads. The haul roads will be inspected weekly for visible silt loading on the road. The haul roads will be swept monthly or whenever visible silt loading is observed.

2.2 Contact Names

Air pollution control equipment is inspected and maintained by various plant personnel as the Facility operates twenty-four hours per day, seven days per week. On any given day, the process operator(s) or maintenance personnel will complete the inspections during their normal course of plant operation. The names of managing personnel overseeing inspection, maintenance, and correction of all air pollution control equipment are outlined below:

1) Plant Manager: Gunner Greene
2) Operations Manager: Keith Wetzel
3) Maintenance Manager: Darrell Dey
4) Production Manager: XXXXXXXX

Staff can be contacted at (218) 998-4301.

2.3 Plan Review

This Plan will be reviewed, updated, and changed as needed, based on future plant operation and/or changes, but no less than once every five (5) years.

2.4 Inspections and Records

The Facility incorporates an active and hands on approach with regards to their Preventative Maintenance Program. Maintenance items are equipment specific and based on manufacture recommendations and equipment history. Records of maintenance actions will be maintained for five years after the maintenance action is completed.

Other routine maintenance outside of the planned shutdowns includes, but is not limited to:

- Washing of Scrubber packing material
- Greasing of Baghouse bearings and augers
- Greasing of Cooling cyclone fan and motor
- Inspection of Loadout flare fan

2.5 Plan Training

Personnel will be given no less than two (2) hours of training per year on operational procedures and permitted levels of operation.

2.6 Correction Action Measures

The facility will implement preventative maintenance practices as discussed in Section 4.0 of this document to limit unit malfunctions. In the event a control unit malfunctions to the point operational conditions are not met, the facility staff will take corrective actions to restore the unit to proper operations. The following is a selection of some of the corrective actions that may be required:

Control Unit Type	Potential Malfunction	Corrective Action*
Baghouse/Vent Filter	Pressure drop out of range	Inspect filters for tears; replace if necessary
	Visual dust readings at stack are abnormal	Inspect unit and clean/repair/replace filters as necessary
Scrubber	Pressure drop out of range	Ensure water flow parameters are met; complete an inspection of the unit as necessary
	Water flow rate decreases below allowed limit	Increase flow; ensure rate remains at acceptable level
Multiclone	Pressure drop out of range	Inspect units for proper operations
Oxidizer	Temperature decreases below allowed limit	Increase temp.; ensure temp. remains at acceptable level
Flare	Pilot flame is not present	Inspect unit; replace burner if necessary; ethanol will not be loaded out while the flare is not operating
	Heating value decreases below allowed limit	Increase fuel source to ensure proper combustion
Paved Roads	Dust is visible on roads	Clean roads in accordance with conditions in facility air permit for emission unit FS 004 (control ID CE 020)

*All corrective actions are recorded for applicable reporting to the agency.

3.0 OPERATING CONDITIONS

As part of the Facility's air permits, there are a number of operating conditions that must be followed. As part of this Plan, the following conditions need to be followed, maintained, and appropriately documented:

- The maximum production rate of ethanol shall not exceed 65,000,000 gallons of 200-proof ethanol during each consecutive 12-month period.
- All the air pollution control equipment must be properly installed, operated, and maintained at all times, whenever the emissions source that it is designed to control is operating.
- Wet cake by-product will be stored for no more than 72 hours on-site unless the outside temperature is less than 55 degrees F.
- The Multi-clones shall be continuously operated to pre-treat the exhaust stream from the dryers; whenever the dryers are in operation.
- The exhaust from the truck loading rack shall be directed to the flare whenever product (ethanol) is being loaded.